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SOUTHWEST FISHERIES CENTER

MONTHLY REPORT - JANUARY 1977

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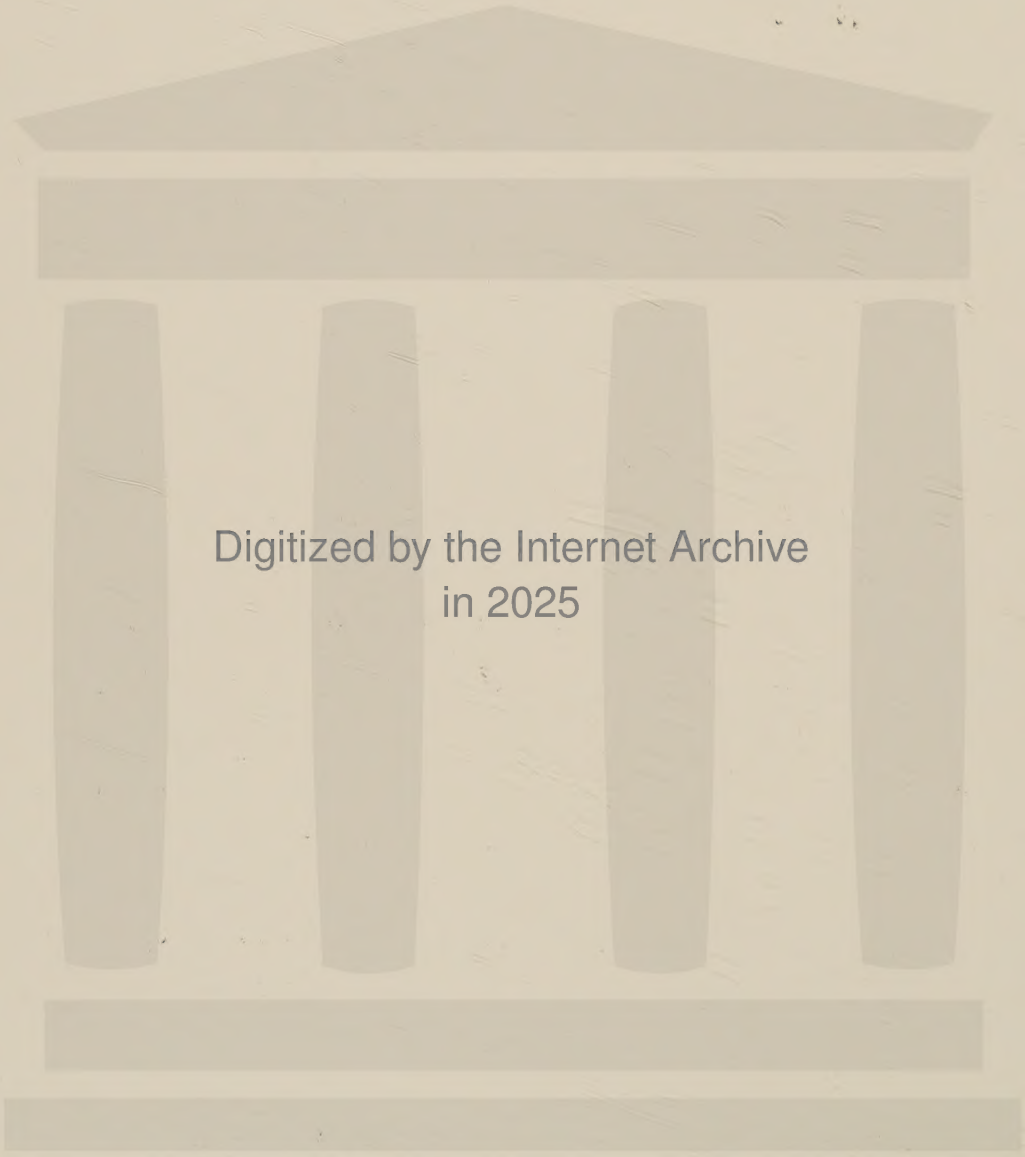
NOAA/NMFS



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SOUTHWEST FISHERIES CENTER
La Jolla, California

Honolulu Laboratory
La Jolla Laboratory
Tiburon Laboratory
Pacific Environmental Group

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STATUS OF PUBLICATIONS

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Smith, Paul E. Precision of sonar mapping for pelagic fish assessment in the California Current. For publication in Journal du Conseil.

Barkley, Richard A., William H. Neill, and Reginald M. Gooding. Hypothetical habitat of skipjack tuna based on temperature and oxygen requirements. For publication in Fishery Bulletin, U.S.

Yoshida, Howard O. The biology and resources of the bonitos, genus Sarda. For publication in U.S. Department of Commerce, NOAA Technical Report, NMFS Circular.

Translations

Sakiura, Haruyuki (translator). 1972. The pelagic armorhead, Pentaceros richardsoni, fishing grounds off the Hawaiian Islands, as viewed by the Soviets (So-Ren kara mita Hawaii oki kusakari tsubodai gyojyo). Suisan Shuho (The Fishing & Food Industry Weekly) 658:28-31. (Translated from the Japanese by Tamio Otsu, 1977, 7p., Translation No. 17.)

Sasaki, Takashi. 1974. The pelagic armorhead, Pentaceros richardsoni Smith, in the North Pacific (Kita Taiheiyo no kusakari tsubodai). Bulletin of Japanese Society of Fisheries Oceanography. 24:156-165. (Translated from the Japanese by Tamio Otsu, 1977, 13 p., Translation No. 16.)

This report does not constitute publication and is for information only.

Suisan Sekai. 1976. The present status of the alfonsin, Beryx splendens, fishery in the Midway fishing grounds (Midway kai-iki no kin-me sogyo no genkyo). (Excerpts) Suisan Sekai 25(8):28-32. (Translated from the Japanese by Tamio Otsu, 1977, 5 p., Translation No. 18.)

HONOLULU LABORATORY

RESOURCE ASSESSMENT AND DEVELOPMENT INVESTIGATIONS (RADI)

Agreement Still Not Forthcoming on Tripartite Cooperative Study of the Northwestern Hawaiian Islands (NWHI)

Dr. Robert Skillman, Coordinator of the NWHI study at the Honolulu Laboratory, reported an impasse on details of the cooperative agreement for the study. The impasse, between the Hawaii Division of Fish and Game (HDFG) and the U.S. Fish and Wildlife Service (USFWS) involves restrictions placed on research activities of HDFG inside the Hawaiian Islands National Wildlife Refuge, as defined by the USFWS. Dr. Skillman held discussions with Director Shomura on possible means of resolving the impasse as well as options to pursue if the impasse cannot be resolved. The next meeting of the principal participants has been scheduled for February 14, 1977.

Recapture of Tagged Skipjack Tuna Reported

RADI Chief Tamio Otsu reported the recapture of a tagged skipjack tuna by a Hawaiian pole-and-line sampan and on the events that led to the determination of the identity of the research agency that tagged the fish. The reason it took some doing to determine the origin of the tag was that there was no identifying legend on the tag. The inner core of the tag bearing the legend had fallen off and what remained was only the outer tubing of the tag.

The tag was sent to the Inter-American Tropical Tuna Commission (IATTC) in La Jolla California, for possible identification. It turned out that the tag was not the type used by the IATTC. The IATTC in turn sent the tag to the Far Seas Fisheries Research Laboratory (FSFRL) in Shimizu, Japan. The FSFRL scientists positively identified the tag as one of their own and noted it was part of a batch of a new type of tag that was used only on two occasions, on May 17 and 18, 1976.

The FSFRL scientists believe that the skipjack tuna in question was tagged on the 17th of May in the western Pacific at lat. 31°57' N., long. 159°12' E. The fish probably measured between 42 and 59 cm and was among 186 skipjack tuna that were tagged that day by scientists on board the Fuji Maru. The fish was recaptured on December 9, 1976, 206 days after release, 45 miles south of the coast of Waianae, Oahu by the M/V Bluefin. The fish was 68 cm long and weighed 7 kg when recaptured. It had traveled a straight line distance of over 2,200 nautical miles. Mr. Otsu noted that this is the first record of a long-range west to east movement of a tagged skipjack tuna in the Pacific.

Plans Prepared for Additional Cruises to the NWHI

Mr. Richard Uchida, Acting Task Leader, Insular Resources Task at Honolulu, prepared a preliminary draft for a charter cruise to the NWHI in April on the F/V Easy Rider. This will be a "piggy-back" charter in that the Easy Rider will be under charter to do some work in the NWHI for the NWAFC's Marine Mammal Division at the same time. Mr. Uchida also completed a draft of the plans for Townsend Cromwell Cruise 77-02-75, Part II. The cruise will extend from mid-June to mid-August and is a continuation of the series of cruises scheduled for the NWHI. Arrangements were also completed with Captain Skip Naftel of the Easy Rider and Captain Leo Ohai of the F/V Libra to place observers on their vessels on fishing trips to the NWHI in January. Observers will be Research Assistants Brian Lau on the Easy Rider and Chip Boyle on the Libra.

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Survey of Insular Resources Task (IRT) personnel were engaged in various activities relating to the NWHI study. Mr. Thomas Hida, who was chief scientist on Townsend Cromwell Cruise 76-06-73 completed the first draft of the narrative report for the cruise. Mr. Hida also completed arrangements for his forthcoming trip to Alaska to participate in a bottom trawling cruise of the NOAA ship Miller Freeman.

Research Assistant James Uchiyama briefed the observers who will be assigned to collect data on the commercial fishing vessels F/V Easy Rider and Libra. The Easy Rider and Libra will be fishing for lobsters and other species in the NWHI. Mr. Uchiyama also made meristic observations on the red-tailed opelu, Decapterus russelli, caught during the recent Townsend Cromwell cruise to the NWHI. The capture of D. russelli provides a new distributional record for this species in the NWHI.

Mr. Ray Sumida worked with Insular Fishery Resources Task (IFRT) personnel to prepare a field procedures manual for the NWHI study. This work is continuing. Research Assistant Paul Shiota worked on refurbishing and fabricating fish traps to be used in future NWHI cruises.

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Mr. Uchida completed a short report, "Experimental and commercial lobster trapping in Northwestern Hawaiian Islands waters" for the Director's Office. He also completed a background document, "A summary of environmental and fishing information of the Northwestern Hawaiian Islands" (Administrative Report No. 4H, 1977), completed the revision of "Synopsis of biological data on frigate mackerels, genus Auxis," and continued work on a paper for FAO, "The fish resources of the western central Pacific Ocean."

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Mr. Walter Matsumoto, Fishery Biologist, prepared a tuna aggregation project proposal for submission to the Pacific Tuna Development Foundation. He also made revisions to the skipjack tuna species synopsis manuscript, "Synopsis of biological data on skipjack tuna, Katsuwonus pelamis Linnaeus," by Matsumoto and Skillman.

Estimated Hawaii Catch of Skipjack Tuna in Early 1977 Above Long-Term Average

The January 1 to 23 Hawaii landings of skipjack tuna were estimated at 422.1 MT (metric tons), which is 302.2 MT above the 1976 landings for the same period and 342.8 MT above the 1948 to 1976 long-term average.

FISH-ENVIRONMENT INVESTIGATIONS

Experimental Ecology of Tunas Group Makes Plans for Intensive Experiments in the Spring and Summer

The Experimental Ecology of Tunas group at the Honolulu Laboratory, led by Dr. Andrew Dizon, spent the last month preparing for the anticipated spring and summer influx of tunas. Experiments are being prepared to test effects of environmental temperatures on activity and body temperatures in yellowfin tuna, to study various metabolic and heat flow characteristics of forced-swum skipjack tuna, to determine effects of turbidity of behavior, and to measure active metabolic rates. The yellowfin tuna experiments will be conducted in the behavioral thermoregulation tank of Kewalo Basin. The fish will be maintained at one of three or four water temperatures for lengthy periods; activity will be continually monitored. Body temperatures will be telemetered with the Oak Ridge temperature-sensitive ultrasonic transmitter. Experimental output will be the effects of temperature on swimming speed, behavioral responses to water temperature change, and activity and water temperature effects upon body temperature. Thermoregulatory abilities will be assessed.

Metabolic and heat flow characteristics of forced-swum tunas will be tested in the swimming tunnel (analogous to the familiar wind tunnel) presently under construction. Dr. Peter Hochachka and associates (University of British Columbia) will be studying the biochemical integration of aerobic and anaerobic carbohydrate metabolism at various swimming speeds. These data will provide information on the energetic costs of rapid swimming. Mr. Richard Brill and Dr. Andrew Dizon will be investigating the relationship between swimming speed and red/white muscle activity. At the same time heat flow and temperature profiles will be measured. This may provide indications on how the tuna manages to rid itself of the tremendous amount of heat that our theoretical models predict it must generate at speeds only slightly above the minimum.

Active metabolic rate will be determined in a closed-system respirometer. This is essentially a tank with a lid; two fish are placed in the tank, the lid is attached, and the rate at which oxygen is removed from the water is the respiration rate. Rates at minimum levels of activity (routine respiration) have been determined. To force the fish to swim faster than minimum, the tuna's

lack of any kind of hydrostatic equilibrium mechanism other than the lift generated by forward motion will be used. Since the skipjack tuna has no swim bladder, any increase in density must be compensated by faster swimming. The skipjack will be force-fed inert pellets (lead) of known weight. Theoretical calculations, based on a 45-cm fish, would predict increases of swim speed up to about 5 lengths sec^{-1} at which time maximum stomach capacity is reached.

An experiment is being devised to determine the overt behavioral responses to decreased visibility due to increased turbidity. Random movements and feeding behaviors will be examined. The data may aid in predicting behavior of skipjack and yellowfin tunas in purse seines--does turbidity prevent escape?--and in predicting the effects of discharge plumes from sea floor mining operations--will tunas avoid areas of increased surface turbidity perhaps affecting migratory pathways?

Honolulu Laboratory Biologist to Participate in New Zealand Billfish Tournament

Heeny Yuen, Leader of the Recreational Fisheries Task, Honolulu Laboratory, recently received Washington approval to participate in the 5th Annual Bay of Islands Billfish Tournament between March 17 and April 6 in New Zealand. At the tournament Mr. Yuen will be measuring and examining all the fish caught by tournament participants and also will be working on other cooperative projects with fishery biologists in New Zealand.

One of the aims of the Recreational Fisheries Task is to devise Pacific-wide data collection system for recreational fisheries. In this regard Mr. Yuen will be examining historical catch records maintained by the fishing clubs in New Zealand. He will also make a stopover in Fiji to stimulate interest in data collection on recreational fisheries there.

Mr. Yuen's participation is being underwritten by the New Zealand Game Fish Council and the Hawaiian International Billfish Association.

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Dr. Andrew Dizon and Mr. Richard Brill attended the Tuna Physiology Workshop in La Jolla, California, which was jointly sponsored by the NMFS Southwest Fisheries Center, Hubbs Sea World Research Institute and the Inter-American Tropical Tuna Commission (IATTC). Dr. Gary Sharp, IATTC, was the convenor. Dr. Dizon presented a paper on the environmental effects of fish activity and muscle temperature. The paradox between the necessity of conserving heat at low swim speeds and dumping heat at medium and faster speeds was discussed as evidence for an acute ability to thermoregulate. Mr. Brill discussed routes of heat loss, stasis respiration, and temperature effects on muscle contraction speeds. The material presented at the conference will be collectively published.

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Dr. James Kitchell and Mr. Don Stewart (University of Wisconsin) are spending the month of January in Honolulu working with Dr. Dizon and Mr. Brill. Dr. Kitchell also presented a paper at the Tuna Physiology Workshop in La Jolla on models of skipjack and yellowfin tuna energy budgets. Dr. Kitchell and Mr. Stewart are presently undertaking evaluation of the several theoretical approaches to tuna bioenergetics. Their purpose is to identify the critical parameters to be derived from experimentation.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

ALBACORE FISHERIES PROGRAM

Two U.S. Albacore Jig Fishing Vessels Complete Exploratory Fishing

Dr. M. Laurs, Oceanographer at the La Jolla Laboratory, completed an Administrative Report which is being distributed to fishermen, the American Fishermen's Research Foundation, and Pacific Tuna Development Foundation, and others concerning albacore trolling exploration conducted across the northern Pacific by two U.S. jig fishing vessels in 1976. This is the second time that U.S. albacore jig fishing vessels have conducted exploratory fishing efforts for albacore in the western North Pacific. A major objective of the survey was to evaluate the possibility for jig fishing for albacore in the western Pacific, especially in the vicinity of the Emperor Seamount chain near 35° N and 170° E. Secondary objectives were to gain information for use in migration studies of North Pacific albacore and the association of albacore with oceanographic features. Also, the vessels carried on fishing operations to assess and evaluate the possibilities for jig fishing for albacore and other tunas along the Hawaiian Island chain.

The fishing vessels, Typhoon with Captain Keith Coburn and Santa Ines with Captain Danny Romero, participated in the exploratory fishing operations. One of these was chartered by the American Fishermen's Research Foundation (Typhoon) and the other by the Pacific Tuna Development Foundation (Santa Ines). The vessels cooperated with the NOAA/Southwest Fisheries Center in keeping detailed daily fishing logs, making daily oceanographic observations (including surface and subsurface temperature measurements), making marine weather observations, conducting albacore tagging operations, and collecting specimens for biological and chemical analyses.

Fish Catches

The vessels caught approximately 32,000 pounds of albacore. Daily catches of albacore were generally low, with the exception of a few days when catches in excess of 200 fish were made. The highest daily total catch for the two

vessels was 732 fish. Best catches were made in the area between 35° to 39° N and 163° to 171° E. Virtually no catches of albacore were made between the Hawaiian Islands and 174° E, and only small catches were made on a few days while fishing/travelling from the west coast to the Hawaiian Islands and return. The size of albacore ranged from 5 to 35 pounds with 12- to 18-pound fish predominating.

Approximately 12,000 pounds of yellowfin and skipjack tunas were caught by the two vessels. Most catches of yellowfin and skipjack were made in the vicinity of islands in the Hawaiian Island chain. The best total daily catch of skipjack was 140 fish averaging 9 pounds, made near 28° N, 177° W. The best total daily catch of yellowfin was 51 fish, ranging from 12 to 80 pounds, made at 23° N, 165° W.

In addition to tunas, at times catches of dolphinfish, amberjacks, wahoo and other fishes were made in the vicinity of the Hawaiian Island chain. A total of about 1,000 pounds of these "market" fish was landed.

Oceanographic Conditions

Oceanographic conditions in the western North Pacific were much different during 1976 than they have been during the past several years. Japanese scientists attribute this alteration of oceanographic conditions largely to a change in the patterns of the Kuroshio Current. The variation in oceanographic conditions appears to have markedly influenced the migratory patterns of albacore in 1976 in the western North Pacific resulting in, among other things, an apparent low availability of albacore in the Emperor Seamount chain during late May through July 1976 and consequently reduced catches by the U.S. jig vessels.

Sections of the vertical distribution of temperature determined from bathythermograph observations and albacore catches made by U.S. albacore trolling vessels showed that the vertical ocean thermal structure was similar in 1975 for the area north of the Hawaiian Island chain to the region just east of the Emperor Seamount; however, marked differences between the 2 years are evident in the vicinity of the Emperor Seamount, where most fishing took place.

It appears that the alteration of oceanographic conditions in the western North Pacific in 1976 markedly influenced the migratory behavior and patterns of albacore in that sector of the Pacific. These factors apparently affected the fishing success of the U.S. exploratory jig fishing vessels operating in the vicinity of the Emperor Seamount chain. Evidence indicates that albacore did not migrate through the Emperor Seamount area in substantial numbers until several months later than has occurred in recent years and after the charter for the U.S. vessels had terminated.

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Dr. Laurs attended a task force meeting concerning NMFS vessels at NMFS Headquarters in Washington, D.C. during January 14 to 17.

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R. Lynn, Oceanographer at La Jolla, headed an effort to design an on-line computer system to interface the oceanographic instrumentation aboard the R/V David Starr Jordan. A system in use by the GEOSECS project at Scripps Institution of Oceanography was reviewed. With the assistance of interested parties (including K. Bliss, F. Kellenberger and L. Eber), system requirements were established and products from several manufacturers were examined. P. Smith and R. Hewitt conducted a parallel study upon the sonar study requirements. The proposed system will permit on-line collection and monitoring of data from the STD, XBT, and thermosalinograph. Additionally, other instruments such as the salinometer and florometer will be interfaced as required. Bottlecast data will be keyed-in. The system should permit considerable and perhaps complete processing and analysis of oceanographic data at sea.

STOCK AND RECRUITMENT PROGRAM

Effect of Ultra-Violet Radiation on Fish Eggs and Larvae Measured

In November 1976, Drs. John Hunter and Geoff Moser of the La Jolla Laboratory, and John Taylor of the University of California, San Diego, began work on an Environmental Protection Agency reimbursable project designed to determine the effect of various levels of ultra-violet (UV) radiation on the eggs and larvae of marine fishes.

Variables to be studied include survival, growth, feeding capabilities, pigmentation, organogenesis, morphogenesis, and general pathology of UV exposure. Other personnel currently working on this project include Kathy Dorsey, Bob Hundt, and Tom Kaufman on NMFS and Bev Masewicz and Charlene Brinkman of UCSD.

Two systems for determining UV effects on eggs and larvae were designed. One is an air-conditioned room in the SWFC aquarium, consisting of two temperature-controlled water baths, 12 x 3 feet, above which will be suspended fluorescent lamps and UV lamps (filtered with polystyrene to eliminate UV-C wave lengths. The other is on the roof of the NMFS Southwest Fisheries Center, consisting of a water bath, enclosed with screen glass or Aclar (these materials transmit UV-B), air and water temperature control and FS-40 (UV) lamps to provide supplemental UV-B. The first system is more convenient and has greater capacity for treatment groups, but visible flux levels are lower than, and are not an exact spectral match to, natural radiation as is the case in the second system. In both systems, treatment levels will be produced by placing perforated filters of mylar and solid filters of Aclar and mylar over containers in the water bath.

Manuscript Describes Techniques for Predicting Nutritional State of Laboratory-Reared Jack Mackerel Larvae

This month, Ms. G. Theilacker, Fishery Biologist at the La Jolla Laboratory, completed the first draft of a manuscript entitled, "The histological and morphological characteristics of jack mackerel larvae, Trachurus symmetricus." Two independent techniques, which allow the prediction of the nutritional condition of laboratory-reared larvae, are presented in the paper. The histological analysis relies on a microscopic examination of the individual larval tissues and the morphometric method, using five external body measurements, relies on a step-wise discriminate analysis. Both techniques are better than 80% successful in classifying the feeding or starving larvae.

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Morphological and length-weight relationships are important tools for assessing the survival probabilities and growth potential in larval fish. From previous laboratory experiments, however, there was evidence of systematic departure from the simple log-log regression model. Recent examination of data taken from field samples by Dr. David Arthur, NOAA Research Fellow at the La Jolla Laboratory, also indicates that a non-linear model is required.

Mr. James Zweifel, Mathematician at the La Jolla Laboratory, has expanded a previous manuscript on allometry in larval fish to include both confidence interval estimation and significance tests for departure from the log-log model and for comparisons of several non-linear relationships. These procedures may be used to examine area and season differences in growth patterns from field samples as well as the effect of controllable parameters in laboratory experiments.

New Procedure Enhances Study of Daily Increments on Otoliths of Larval Fishes

Mr. David Kramer, Fishery Biologist at the La Jolla Laboratory, reports that the study of daily increments on the otoliths of larval and juvenile fishes has been greatly improved with a procedure recommended by Dr. Edward B. Brothers of Cornell. Dr. Brothers has suggested using a closed circuit television camera and monitor with the camera mounted on the vertical tube of the tri-noc head of a compound microscope. When the oil immersion objective is used, it is possible to project an image on the monitor such that a 1-m interval on an otolith is magnified to 1.5 to 1.7 mm on the screen. Shown in the photograph is the set-up with the image of a 40- m otolith from a 10-mm anchovy larva on the screen. Not only is the task of counting and measuring easier and more accurate, but it is also possible to discuss and demonstrate the various aspects of any otolith while two or more persons are viewing the screen at the same time.

The camera in use now scans 525 to 625 lines per inch with internal and external synchronization in a 2:1 interlace. The monitor has a 9-inch (22.9 cm) diagonal video tube of which the vertical resolution is 350 lines per inch and the horizontal resolution is 750 lines per inch.

Fishery Biologist David Kramer at the La Jolla Laboratory inspecting an otolith from a 10-mm anchovy larva projected on television screen. The otolith measures 49 microns and is enlarged 1,500 times on the screen. Calculation of daily growth rings shown on the otolith indicates the larva was 23 days old.

ECOLOGY OF THE CALIFORNIA CURRENT

During January there were two main thrusts in the Multiple Species Taxonomy program at the La Jolla Laboratory, according to Dr. Elbert Ahlstrom, Program Leader. A concerted effort is being made to reduce the backlog of collections acquired on CalCOFI cruises during the 1972 and 1975 surveys in order to be current when the proposed 1978 survey collections become available. All persons in the unit are doing some work on identification and enumeration of CalCOFI collections.

Work also continued on several research projects, including preparation of a manuscript on midwater trawl collections made on extended CalCOFI Cruises 7205 and 7210, work on description of the life history series of the rockfish, Sebastes melanostomus, and a study of pigmented pleuronectid larvae belonging to the genera Pleuronichthys (four species) and Hypopsetta (one species). For the latter, illustrations have been mostly completed and morphometric tables prepared.

Data have also been assembled for a CalCOFI Atlas dealing with rockfish distributions covering all years between 1950 and 1972.

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT IS NEW PROGRAM AT LA JOLLA LABORATORY

The Fishery Conservation and Management Act of 1976 (FCMA) provides for exclusive fisheries authority over resources within 200 miles of the United States coast, a mechanism for the States and the Federal government to interact in partnership in the conduct of fisheries management. The Act, which will go into effect at midnight on February 28, 1977, will require the application of innovative and advanced fishery management techniques to fishery resource management.

At the La Jolla Laboratory the Extended Jurisdiction effort is now focused in a new program entitled, "Commerical and Recreational Fisheries Research for Management." This program incorporates the previous "Recreational Fishery Analysis" program and a new fisheries economics task. The program is intended to develop biological and socioeconomic data and analyses for fisheries management in the California Current area. In particular, anchovy, jack mackerel, sardine, Pacific mackerel, hake, rockfish species and a variety of local southern California pelagic fish (yellowfin, barracuda, bonito, etc.) will be studied.

Personnel requirements are nearly filled with the recent addition of Dr. Daniel Huppert, Economist, and Keith Parker, Statistician. One additional economist at the GS-9/11 level will be added in the near future. From the original Recreational Fishery Analysis Program are Dr. Gary Stauffer, Mr. John MacGregor, Fishery Biologists, and Joe Caruso, Mathematical Technician (temporary). Dr. Huppert has been chosen as Program Leader.

The Pacific Fisheries Management Council has named Drs. Huppert and Stauffer to the Anchovy Fishery Management Plan Development Team. Other members of the Team are Alec MacCall and Herbert Frey, California Department of Fish and Game, and Ole Mathisen, Fishery Research Institute, University of Washington. The Team plans to have prepared a draft of the Anchovy Management Plan by June 1, 1977. Accordingly, the plan development effort occupies a central place in the activities of the Extended Jurisdiction program currently. Jack mackerel will probably be the next focus of attention.

Pacific Regional Fisheries Management Council Meeting Held in San Diego

The entire staff of the Commercial and Recreational Fisheries Research for Management program at the La Jolla Laboratory attended the meeting of the Pacific Regional Fisheries Management Council in San Diego on January 12.

Economist Dan Huppert, of the La Jolla Laboratory, speaking for the Anchovy Management Plan Development Team, read a prepared statement to the Council regarding the activities of the Team. Since the Team has just begun to organize its efforts, a general statement of intentions and views about fishery management comprised the Team's first report. The Team met with the recently-assembled Anchovy Advisory Panel for most of the day on January 12 and during the morning of January 13.

Data Base Design and Coding Format Developed for Aerial Spotter Logs

Mr. Joe Caruso, Mathematical Technician at the La Jolla Laboratory, continued the development of a coding format and data base design for the aerial survey logs from Biologist Jim Squire's fish spotter program. The survey information will be divided into two data bases, one containing the effort or search information and the second containing the sighting data. Proposed data elements and formats for each base have been drawn up and are currently being reviewed. An efficient design depends on the order of the information retrieved for analysis. Considerations have been given to making the data base compatible with California fishing vessel log data if, in the future, it may be desirable to link the two data sources for purposes of measuring catch per unit of effort.

Anchovy Catch Per Unit of Effort Index of Biomass to be Developed

Recently recruited to the Commercial and Recreational Fisheries Research for Management program at the La Jolla Laboratory, Statistician Keith Parker began a review of California Department of Fish and Game anchovy vessel log system and aerial fish spotter logs for the purpose of developing a catch per unit of effort (CPUE) index of biomass. He has proposed a computer format for coding and keypunching the vessel logs. The format must be compatible with the Center's data base system as well as the standard data file scheme. A preliminary outline was prepared on how to analyze CPUE for a purse seine fishery where catch is limited by fish availability and vessel carrying capacity. Formats and plans will next be discussed with CF&G biologists.

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With Mr. Alec MacCall, CF&G marine biologist assigned to the La Jolla Laboratory, Mr. Parker reviewed a manuscript by scientists from the Instituto Nacional de Pesca (INP-Mexico) on an application of principal components to a fishing power analysis of the Ensenada anchovy fleet. This paper was part of the work of the INP-CalCOFI catch per unit of effort subcommittee.

Principal components were used as a system for scoring boats based on nine vessel characteristics, which were essentially various measures of vessel size (length, hold capacity, horsepower, etc.) which are highly correlated. The first principal component, a specific linear combination of these factors, was found to be highly correlated with mean catch per trip and was suggested as a possible fishing power correction factor.

Messrs. Parker and MacCall concluded that the first principal component could be interpreted as a composite measure of vessel size. The correlations with mean catch per trip, therefore, reflects the fact that larger vessels are capable of landing more fish. Hold capacity has an equally high correlation with catch per trip, and is a more logical and direct correction factor than the first principal component. This high correlation points out the need for a better measure of effort than vessel trip.

Findings Indicate Area of Hake Spawning Has Decreased to Critically Low Level

Representing the La Jolla Laboratory, Dr. Gary Stauffer attended and presented a report titled, "Indices of abundance for Pacific hake, 1951 to 1976" at the U.S.-U.S.S.R. scientific bilateral meetings in Seattle, Washington, January 17-22.

The major findings in Dr. Stauffer's report were that the 1975 spawning hake population was relatively large but that beginning in 1966 the area of spawning has decreased to a critically low level, particularly in 1976.

Following the meeting in Seattle, members of the Soviet delegation--Dr. Y. Yermakov, Mr. Y. Efimov, and Mrs. L. Nazarova, accompanied Dr. Stauffer to La Jolla for a 2-day visit. The visitors toured the Center and the Scripps Institution of Oceanography, visiting many of the scientists at both facilities. Dr. Yermakov studied the population dynamics of Pacific hake for his Ph.D. dissertation and has participated in a number of research cruises in the Southern California Bight on Soviet vessels conducting joint cooperative surveys with the U.S. of the spawning hake population.

Rockfish Research

Mr. John MacGregor, Fishery Biologist at the La Jolla Laboratory, is examining otoliths and scales of various species of rockfish for determining best aging methods. Routine measurements of length and weight were also obtained. For some species of rockfishes such as starry rockfishes and the rosy rockfish, about 99% of the scales are regenerated. For other species, the percentage is much lower. Several samples of trawl-caught fish of the zero age group were measured to obtain a better understanding of first-year growth.

Oceanic Fisheries Resources Division

PORPOISE/TUNA PROGRAM

NMFS and Industry-Sponsored Porpoise Rescue Foundation Map Joint Porpoise Research at Meeting

On January 5, a meeting was held at the SWFC, La Jolla, to discuss gear research plans for 1977 and the writing of a report on last fall's mass test of porpoise-saving gear and techniques. Participating in the meeting were representatives of the Porpoise Rescue Foundation (PRF)--a tuna-industry financed group--staff of the Porpoise/Tuna Interaction program at the La Jolla Laboratory, and Dr. Robert Hofman of the U.S. Marine Mammal Commission.

According to Mr. John Everett, Manager of the Porpoise/Tuna Program, the group agreed that extension-type work was of the highest priority and that both the Porpoise Rescue Foundation and the National Marine Fisheries Service would put as much effort as possible into meeting with fishermen on the docks to introduce and encourage the use of new gear and techniques.

Also, as a result of this meeting NMFS will take the lead in installing an anti-rollup purse block. The block, being built by MARCO, is nearly complete and will be installed aboard a tuna purse seiner that experiences an abnormal rate of rollups, an important cause of porpoise deaths in the net. Through the tuna industry, the PRF has agreed to test a snap ring that allows net hauling to begin before pursing is complete. This should eliminate the incidence of porpoise being caught in slack webbing near the vessel stern and should also allow net hauling to continue under certain types of rollups and allow a vessel to get to the time of backdown faster.

The NMFS has also agreed to take the lead in conducting further research on the large-volume net concept. The large-volume net built by NMFS has been loaned to a new tuna vessel for further tests. However, the vessel owner has reported the net to be in poor condition and he expects to return the net to NMFS shortly.

Aerial-Ship Survey to Estimate Porpoise Populations in Progress

On January 4, the NOAA research vessel, David Starr Jordan, left San Diego, while the NOAA research vessel, Townsend Cromwell, departed from Honolulu on January 6. Both ships are scheduled to conduct a survey of porpoise populations. The vessels will cover cruise tracks that, for the most part, cannot be covered by the aerial survey aircraft. As of this writing, both vessels are at sea. The Jordan will return to San Diego on or about March 9; the Cromwell is scheduled to dock in Honolulu on March 22.

In San Diego, the aircraft, a P2V-7 Neptune, from the Office of Aircraft Services of the U.S. Department of the Interior, underwent outfitting, including the installation of cameras. Training for the survey began on January 3 and has included in-the-air training over local porpoise schools with a light aircraft, survival training, and identification and procedural training. Departure of the survey crew was delayed until January 19 in order to receive over-flight clearance from Mexico and France.

Industry Offers to Dedicate Vessels to Porpoise Research

A meeting was called by Mr. Frank Alverson of the Porpoise Rescue Foundation and held at the SWFC, La Jolla, on January 4, to discuss research projects for a vessel to be dedicated by the tuna industry exclusively for research on the porpoise/tuna problem. As a result of this and a subsequent meeting on January 11 and 12 to further review the projects, a tentative list of projects and a schedule for their accomplishment was forwarded to the PRF for formal review.

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Two manuscripts, both significant contributions to the literature on porpoise biology, have been accepted by the Fishery Bulletin, U.S. for publication: "Reproductive parameters of the offshore spotted dolphin, a geographical form of Stenella attenuata, in the eastern tropical Pacific, 1973-1975," by William Perrin, Ruth Miller, and Priscilla Sloan and "Growth and reproduction of the eastern spinner dolphin, a geographical form of S. longirostris in the eastern tropical Pacific," by William Perrin, David Holts, and Ruth Miller.

TUNA RESOURCES PROGRAM

Tuna Vessels Participate in FAX Program

During January 1977, 20 U.S. seiners participated in the FAX program of the La Jolla Laboratory. Reporting rates for January were up from January 1976 by 15.9% as shown below:

January Reporting Rates

	Weather Observations	XBT Observations	Total
1976	136	28	164
1977	185	5	190
Percent change	+ 36.0%	- 82.1%	+ 15.9%

The fishing vessel, Santa Elena, led all cooperating vessels with 20 marine weather observations radioed to WWD in January.

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The December issue of Fishing Information went to press on January 24, and two 15-day supplements were issued during the month, according to James Renner, Editor. The December issue contains a verification card which subscribers must return to continue receiving the publication. This is an annual procedure that is required by law to ensure that an up-to-date mailing list is maintained.

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Preparation for eventual conversion of Fishing Information charts from fahrenheit to Celsius continued during the month. Monthly chart formats for the entire Pacific Ocean were virtually completed by month's end and conversion of 15-day chart normals were begun. Conversion to the Celsius scale is planned to begin with the March 1977 issue of the publication.

PACIFIC ENVIRONMENTAL GROUP

OCEAN CLIMATOLOGY AND MONITORING

Historical XBT Section Data from Equatorial Pacific Analyzed

Dr. Doug McLain, Oceanographer at PEG, has recently analyzed historical XBT section data from the equatorial Pacific. These data were collected by the NSF-NORPAX-supported program of XBT observations from ships of opportunity. Although most of the data collected by this program have been between the West Coast and Hawaii, observations were started in 1972 across the equator to monitor oceanographic conditions in the eastern tropical Pacific. The data were digitized and contour-plotted at PEG and analyzed by Drs. Wyrtki and Meyer at the University of Hawaii and Dr. Patzert at Scripps in cooperation with Dr. McLain at PEG. The analysis shows that ship of opportunity XBT section can be used to monitor the geostrophic transports of the North Equatorial Current and the Equatorial Countercurrent. The time series of computed transports (covering the period August 1972 to March 1975) show consistent seasonal variations from year-to-year that agree with available historical oceanographic data. The computed transports also are in agreement with the theory of Wyrki that the warm waters present in the eastern tropical Pacific during El Niño result from anomalous advection from the western tropical Pacific in the Equatorial Countercurrents and the Equatorial Undercurrent.

The XBT sections were made by the passenger liners Monterey and Mariposa on South Pacific cruises primarily during fall and winter and thus do not provide ideal year around sampling. XBT observations from tuna boats have been made during recent summers and can supplement the passenger ship data to provide a more complete historical series. PEG scientists plan to analyze these obsérvations in this manner in cooperation with the Inter-American Tropical Tuna Commission. XBT observations from the passenger ships have recently been

discontinued but observations are continuing from freighters under NORPAX, PEG, and Navy sponsorship. The resulting time series of transports of equatorial currents will be very valuable in research on large-scale ocean/atmosphere fluctuations (such as the southern oscillation) and how these fluctuations affect the marine populations of the area.

Aerial Survey Made of Gray Whales Near Yankee Point

Mr. Paul Sund, NMFS Platforms of Opportunity Coordinator at PEG, was assisted by members of the San Francisco Bay Chapter of the Oceanic Society in a two part aerial survey of the distribution of migrating California gray whales near Yankee Point, 10 miles south of Monterey, California. Previous studies have shown that 95% of the gray whales migrating past Yankee Point pass within 1.9 km of shore. Initially, Mr. Sund made comparisons between the numbers of whales in pods as seen by NMFS observers on shore and numbers of whales in the same pods as seen from an aircraft from altitudes of 300 to 500. In the latter part of the survey, two observer teams flew identical flight paths along the coast at 30 minute intervals and observed the location and numbers of whales in groups. The data from these two experiments will be used to better access the differences between shore-based and aerial whale observations.

An unusual sighting was made during the aerial survey. A young gray whale and its apparent mother were observed migrating south near Yankee Point. This can be inferred as evidence of an early birth as the animals were over 700 miles from the calving lagoons in Baja California.

TIBURON LABORATORY

HYSIOLOGY INVESTIGATIONS

Sources of Early Mortality Investigated in Striped Bass

Preliminary results of experiments at the Tiburon Laboratory on the factors affecting early life history stage mortality of striped bass and a conceptual model of mortality for all life stages were presented at a meeting of the San Francisco Bay and Estuarine Society at the California Academy of Sciences on January 13 by Dr. Jeannette Whipple and Maxwell Eldridge of the Tiburon Laboratory. The general topic of the meeting was the effect of the dry years on the Delta environment and its resources, including the striped bass population.

Dr. Jeannette Whipple presented a paper at Oregon Chapter meetings of the American Fisheries Society at Ya-nee-ta, Oregon, January 27, in a session on environmental toxicology. The topic was the potential effects of petroleum hydrocarbon pollution on spawning fishes, and included results from previous work on herring and a discussion of the potential effects on striped bass during spawning migration.

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Final plans were made at the Tiburon Laboratory for field sampling of water-soluble hydrocarbon pollutants along the striped bass spawning migration route. A field sampler was designed and is now being machined for use beginning April 1. This work will be done in cooperation with Dr. Marvin Jung of the California Maritime Academy and Brian Jarvis of the NMFS/SWFC Pacific Environmental Group. Simultaneous to sampling for pollutants in the water column, tissue samples including gonads from adult striped bass will be collected at sites near the beginning and end of the spawning migration to determine uptake levels in the gonads and concommitent effects.

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Dr. Jeannette Whipple and Maxwell Eldridge designed new outlines for experiments to be conducted during the spawning season of striped bass. The factors of ionic composition of the water and food will be studied in multivariate laboratory experiments. The bioenergetics and mortality of the larvae under different treatments will be compared at different developmental stages from egg to juvenile.

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A new culturist, Mr. Jack School, joined the Tiburon Laboratory's Physiology staff this month. His responsibilities will be to maintain and provide phytoplankton and zooplankton as needed for physiological experiments with striped bass larvae.

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Preliminary results of electrophoretic determinations by Michael Bowers of lactate dehydrogenase (LDH) isoenzymes in striped bass early life history stages indicate that there is a variability among progeny of different parental crosses, variability among progency of the same parental cross and among different developmental stages from gonadal egg to late larvae. Frequencies of isoenzyme bands in adult tissues were also determined. Five izoenzyme bands, when all tissues and developmental stages were examined, were found. One of these bands appears to be primarily restricted to the early developmental stages. Frequency changes in LDH isoenzyme bands will be correlated with survival in different laboratory environments.

Manuscripts

Two manuscripts were completed in January: "Fate of ^{14}C-benzene (an aromatic hydrocarbon of crude oil in a simple food chain of rotifers and Pacific herring larvae" by M.B. Eldridge and R. Echeverria, to be presented at the California-Nevada Chapter Meeting of the American Fisheries Society, and "Fate of ^{14}C-benzene in Pacific herring (Clupea harengus pallasi) eggs, yolk-sac larvae, and feeding larvae" by M.B. Eldridge, T. Echeverria and S. Korn, currently being reviewed.

OCSEAP Petroleum Research Task: Transport Retention and Effects of the Water-Soluble Fraction of Crude Oil in Experimental Food Chains Studied

Results of preliminary experiments conducted this month indicate that the total water-soluble fraction (WSF) of Cook Inlet crude oil in concentrations of less than one part per million (ppm) is toxic to adult starry founder for continuous exposure periods of less than 48 hours. Concentrations of about 450 parts per billion (ppb) caused increased ventilation rates in starry flounder but resulted in no mortalities during a 96-hour continuous exposure. Ripe or nearly ripe adult starry flounder exposed to concentrations of 80 to 150 ppb for 96 hours showed no discernable abnormalities when autopsied (although chemical analyses and histological examination of gonads and other analyses have not yet been completed).

Littleneck clams were exposed to concentrations of up to 1.5 ppm of the total WSF of crude oil for 96 hours but were not visibly affected. Tissue analyses of the exposed clams have not been completed.

A solubilizer apparatus was sent to the Auke Bay Fisheries Laboratory for use in experiments there. Researchers at Auke Bay report that they are pleased with the solubilizer and have ordered more.

OASTAL FISHERIES INVESTIGATION

New Delivery of Coho Salmon Expected

Mr. Roger Green, Fishery Biologist at the Tiburon Laboratory, reports that another countdown has been started for a new delivery of coho salmon from the Mad River Hatchery. These are the fish that were originally scheduled for delivery last fall, but were retained at Mad River because of disease and slowed development. Their numbers have dwindled from 69,000 last July to about 47,000. The fish are reported to be about 20 to the pound. Delivery will probably be made the last part of January or early in February if the fish are predominantly smolts (adaptable to salt water). There is some pressure to accept the fish early because of increasing overcrowding by other fish at the Mad River Hatchery. One-third of these fish will go to Sea Grant's Tomales Bay pen-rearing project.

Mr. Lee Benson, University of California Extension Agent, visited the Tiburon Laboratory to obtain information and data on the pen-rearing project. Mr. Benson is preparing a general economics study on pen rearing salmon in the same mold as agricultural farm crops studies.

Mr. Chris Keusink visited the salmon facility on behalf of a northern California lumber company. The company is considering a commercial salmon-rearing venture.

Mr. Lloyd Richards has been cooperating with Mr. Richard Nishioka of the University of California, Berkeley, on a temperature-controlled fresh water system for holding young salmon at Tiburon. These fish are for endocrinology studies of parr-reversals and resultant stunting of pen-reared salmon.

Further progress was reported by the Tyee Club on plans for transition of the pen-rearing project from the present feasibility study to a future production operation with only consultative assistance from NMFS. Prospective benefactors of the project are being sought and contacted by the Club.

Local Fisheries Technique Development - Trap Fishing Studies Underway

Robert Glen, Captain of the fishing vessel Patrick L., borrowed 20 of the Tiburon Laboratory's Hawaiian-style fish traps to experiment with their effectiveness in catching rockfish. Certain species of rockfish bring good prices, up to $1.00/lb., in the winter when marketed in prime condition, such as is possible with the use of traps. Bad weather has hampered fishing trials, but preliminary results have not been promising, with catches averaging about 2 to 3 pounds per trap. A Fish and Game ruling that traps be set beyond 3 miles of shore prevents fishing in shallow waters where many of the desired species occur.

Anglers' Guide to the United States Pacific Coast

On January 21, Ms. Susan Smith, Publications Specialist at the Tiburon Laboratory, received from the printer the last set of corrected color proofs of the Anglers' Guide fishing charts. These were checked and corrected, and all 40 charts mailed to senior author Jim Squire at La Jolla for review. It appears that some of the charts will have to be revised before final printing; however, the text, facility tables, and cover artwork have been completed by NMFS Scientific Publications Staff in Seattle and sent to the printer.

Also during the month, address labels were prepared for the 578 people who requested to be notified when the Guide is published. As soon as price information is received from the Superintendent of Documents, these people will be informed by postcard.

Fishing Methods Chronology

In January, Mr. Green and Ms. Smith traveled to the San Francisco Public Library to research early fishing methods and tackle in California. The data they gathered were fragmentary but did help to fill in a few gaps concerning salt water fishing tackle and methods just after the turn of the century. During the month, Ms. Smith also worked on some of the illustrations for the chronology manuscript.

COASTAL FISH COMMUNITIES INVESTIGATIONS

Investigation Members Participate in Meetings

Dr. Edmund Hobson, Investigation Leader at the Tiburon Laboratory, participated in a symposium on ecology of reef fishes at the University of California, Santa Barbara. Dr. Hobson's presentation described the activities of the inshore fish communities task. Tony Chess, Fishery Biologist with this task, participated in a workshop at El Segundo sponsored by the Taxonomic Standardization Program. This workshop, led by Dr. J. L. Barnard of the U.S. National Museum, centered on the amphipods, a major component of the nearshore biota. Correct identifications of these organisms is critical in ecological studies of the nearshore environment. This is especially true of studies involving food habits of fishes, because amphipods probably are the single most important group among prey of nearshore species. Dr. William Lenarz, Leader of the Rockfish Analysis Task, attended a meeting of the Western Fish Marketing Association in Eureka. At this meeting Dr. Lenarz joined biologists from the Northwest and Alaska Centers, the Washington State Department of Fisheries, and both California and Oregon Departments of Fish and Game, to discuss with fishermen the needs of the coastwide rockfish survey.

Results of Pilot Rockfish Surveys Analyzed

Dr. William Lenarz and Mr. Peter Adams, Fishery Biologist at the Tiburon Laboratory, devoted most of January to analyzing data from the pilot rockfish surveys made recently at Monterey and Queen Charlotte Sound. Their main objective is to determine the relative precisions of systematic, random, and random stratified sampling. Preliminary results indicate that systematic sampling is more precise than random or random stratified sampling. Optimal distances for trawling, and allocation of sampling effort among depth strata are also being examined.

Rockfish Samples Taken for Aging Study

Tina Echeverria, Fishery Biologist at the Tiburon Laboratory, collected rockfish samples, most of them yellowtail rockfish, from partyboats at Emeryville, Bodega Bay, and San Francisco. Mss. Echeverria and Fourre have processed most of these specimens in Ms. Echeverria's continuing efforts to learn effective aging techniques. Her results with blue rockfish and yellowtail rockfish have approximated published findings.

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Dr. E. Hobson completed editing the proceedings for the Multispecies Colloquium, held last summer at the Tiburon Laboratory, and completed the first draft describing the research on fish-zooplankton interactions conducted by him and Mr. Chess at Enewetak, Marshall Islands, last spring.

PRESS RELEASES - SWFC

January 13 - "Fishery scientists solve a small mystery about a skipjack tuna" - Honolulu Laboratory

January 23 - "Aerial-Ship Survey to Estimate Porpoise Population" - La Jolla Laboratory (released by NOAA Public Affairs).

SEMINARS

Honolulu Laboratory

January 25 - Dr. James F. Kitchell, University of Wisconsin, spoke on "Application of a fish growth model" at the Honolulu Laboratory.

La Jolla Laboratory

January 3 - Dr. Vance McClure, "Distribution and persistence of chlorinated hydrocarbons in the northeastern Pacific."

28 - Dr. Charles O'Connell, "Histological evaluation of the starving condition in anchovy larvae."

31 - Dr. Tim Barnett, Scripps Institution of Oceanography, "Time and space scales of the Pacific tradewind systems."

HONORS AND AWARDS

January 3 - Lt. E. D. Gullekson, Special Achievement Award - Tiburon Laboratory.

10 - Mr. Thomas Kazama, Special Achievement Award - Honolulu Laborator

TRAINING

Fisheries Gear Technology Training

Lt. Craig Nelson, NOAA Corps Officer assigned to PEG in Monterey, recently completed 2 weeks of training in fisheries technology at the University of Rhode Island. The instruction included lectures, films, and discussions on fishing methods, vessel technology, stability, and propulsion, fishing gear, and electronics. The seven course participants were introduced to various aspects of net repair and construction. Practical experience in bottom trawling was provided aboard the school's training vessel Gail Ann. Training was provided by NOAA's Office of Fleet Operations in preparation for Lt. Nelson's forthcoming assignment to the Townsend Cromwell in August 1977.

Course in Elementary Statistics Offered at Southwest Fisheries Center

Dr. Douglas Chapman, Dean of the College of Fisheries at the University of Washington, and currently on sabbatical at the Center, has kindly offered to present a course on elementary statistics, consisting of 8 to 10 weekly 1-1/2 hour lectures. The course began on January 4 and 20 persons on the Center staff have signed up. The course has been designated as formal training and completion will be entered in each participant's personnel record.

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January 27 - Susan E. Smith, of the Tiburon Laboratory, Systematic Ichthyology, San Francisco State University.

- Tina Echeverria, of the Tiburon Laboratory, Scientific Writing and Editing, San Francisco State University.

EETINGS AND TRAVEL

Southwest Fisheries Center is Host to U.S.-U.S.S.R. Working Group on Marine Mammals

The Southwest Fisheries Center, La Jolla, was the host to a U.S.-U.S.S.R. Working Group on Marine Mammals, January 18-23. The meetings, fourth in a series, were held in accordance with the agreement between the U.S. and the U.S.S.R. on cooperation in the area of environmental protection.

Chief of the U.S. delegation was Dr. R. V. Miller, NMFS, Washington, D.C.

Other members of the U.S. delegation were: Dr. R. Elsner, Professor of Physiology, University of Alaska; Dr. G. Harry, Director, Marine Mammal Division, Seattle; Mr. J. Burns, Chief Biologist, Marine Mammals, Department of Fish and Game, Alaska; Dr. W. Perrin, Southwest Fisheries Center; Dr. W. Evans, Director of the Hubbs' Sea Life Institute; Dr. H. Braham, Marine Mammal Division, Seattle Dr. V. Gallucci, Acting Director, Center for Quantitative Science, University of Washington, Seattle; Dr. J. Estes, Chief, Walrus Investigations, Fish and Wildlife Service; Dr. F. Fay, Professor of Marine Biology, University of Alaska; Dr. M. Tillman, Marine Mammal Division, Seattle; and Mr. C. Fiscus of the Marine Mammal Division in Washington.

The Soviet delegation was headed by Dr. V. A. Zemskii.

Other members of the Soviet delegation were Dr. A. Yablokov, Institute of Developmental Biology, Moscow; Dr. A. Berzin, TINRO, Vladivostok; Dr. A. Sokolov, Institute of Zoology, Leningrad; Dr. G. Fedoseev, TINRO, Magadan; and Mr. V. Mineev, GLAVRIBVOD, Moscow.

During the meeting both sides exchanged work published during the period between the third and fourth meetings. There was also an exchange of data on marine mammal harvest statistics in the North Pacific. The results of U.S. and Soviet research were discussed, as well as the results of joint work during the period after the last meeting held in June 1975. It was noted that this research was successful and provided much new information. Both sides noted that the aerial census of walrus and ice seals conducted in 1975 and 1976 in accordance with coordinated programs was particularly successful.

Mr. John Everett, Manager of the Porpoise/Tuna Interaction Program at the La Jolla Laboratory, presented information on the status of incidental catch of porpoises in the tuna fishery and discussed the problem of lowering the mortality level of porpoises, as well as the question of the dynamics of Pacific dolphin abundance. At the same time, there was discussion of the incidental catch of marine mammals during fishing operations of other nations in the North Pacific and both sides considered it desirable to receive more detailed information on these matters.

The group devoted considerable time to the question of publishing the results of joint research and the protection of marine mammals. Considering the exceptional importance of these animals, it was deemed desirable to publish the results in three volumes: Volume I would include research on pinnipeds and sea otters; Volume II research on cetaceans; and Volume III the principal results and long-term program for studies of North Pacific marine mammals.

The next meeting of the working group will take place in the Soviet Union in the summer of 1978.

Following the end of these meetings, Drs. Yablokov and Sokolov remained in La Jolla for an additional 3 weeks to work on joint research projects with Drs. Perrin and Evans, respectively.

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January 4-7 - Dr. Reuben Lasker at the Brookhaven National Laboratory in New York to participate in conference workshop regarding research in the New York Bight.

5 - Dr. Stanley Swerdloff of PTDF, Honolulu, Hawaii, met with with Mr. R. Shomura, Honolulu Laboratory Director, to discuss PTDF-related matters.

7 - Ltjg. Dale Bretschneider, NOAA Corps, participated as an aerial observer in a California gray whale survey.

7-8 - Mr. Paul Sund, PEG, traveled to Monterey, Ca. to coordinate an aerial whale survey.

January 7-15 - Mr. Susumu Kato, Fishery Biologist at the Tiburon Laboratory, traveled to San Jose, Costa Rica, to attend the Eighth Annual Meeting of the World Mariculture Society. About 75 papers were given during the course of the meeting, and Mr. Kato has the abstracts, and preprints of most of the papers available for inspection.

10 - Mr. Shomura discussed fisheries in the Marshall Islands with Mr. R. McKay, Assistant District Administrator, Marshall District, Mr. Glenn Fredholm, a local Naval architect, Mr. Iversen, and Dr. Swerdloff.

10-15 - Dr. Roy Mendelssohn, of the Honolulu Laboratory, went to American Samoa with Mr. Gordon Broadhead of Living Marine Resources, Inc. to evaluate the mollie baitfish project there.

12 - Mr. Shomura attended a tuna project meeting called by Dr. Tom Nakayama, Chairman, Food Science and Technology Program, University of Hawaii, to discuss skipjack histamine work. Mr. Ito also participated in the meeting.

11 - Mr. Shomura attended a briefing at ETV (Educational TV, Channel 11, Honolulu) to prepare for a program to be shown on ETV's Hawaii Today" program; the show was taped on January 14. He and several others from the local fishing industry discussed extended jurisdiction during the show. The briefing and taping was arranged by Mr. John Shklov of the Marine Advisory Program, University of Hawaii.

13 - Dr. Jeannette Whipple and Maxwell Eldridge, of the Tiburon Laboratory, attended a meeting of the San Francisco and Estuarine Society at the California Academy of Sciences in San Francisco.

13-14 - Mr. Tony Chess, Tiburon Laboratory, participated in a workshop at El Segundo sponsored by the Taxonomic Standardization Program.

15-16 - Mr. Sund of PEG traveled to Monterey, Ca. to coordinate an aerial survey of gray whales.

16-19 - Dr. Michael Laurs of the La Jolla Laboratory at NMFS headquarters in Washington, D.C. to attend meeting regarding ship support systems.

17 - Mr. Shomura attended a meeting of local scientists interested in the Scientific and Statistical Committee of the Western Pacific Regional Fishery Management Council. The meeting was called by Mr. W. Van Campen, Executive Director, Western Pacific Council.

January 17-18 - Dr. Edmund Hobson of the Tiburon Laboratory participated in a symposium on Ecology of Reef Fishes at the University of California, Santa Barbara. His presentation described the activities of the inshore fish communities task.

17-21 - Mr. Lloyd Richards of the Tiburon Laboratory traveled in the Pacific Northwest obtaining information on current pen-rearing practices.

- Mr. Brian Jarvis, PEG, technician on the IDOE/NSF XBT project attended a 3-day STD/Ocean Systems Conference workshop. The meeting was held in San Diego under sponsorship of Plessy Environmental Systems. Mr. Jarvis also visited SWFC and Scripps Institution of Oceanography to discuss matters relating to platforms of opportunity.

18 - Mr. Shomura attended a meeting called by Mr. A. Gerakas at the the State Capitol, to review Island projects to be submitted to the Pacific Tuna Development Foundation.

- Mr. Wally Giguere of the Tiburon Laboratory attended a meeting of the Federal Executive Board Telecommunications Council at Treasure Island, San Francisco.

20 - Messrs. Shomura and Mr. Doyle Gates paid a courtesy call to Mr. H. Kono, Director, Hawaii State Department of Planning and Economic Development. Mr. Kono was briefed on NMFS activities in Hawaii.

18-21 - The SWFC's Tiburon Laboratory was the site for a Workshop on Fisheries Management sponsored by the National Marine Fisheries Service Office of Policy Development and Long Range Planning and Stanford University's Center for Technology Assessment and Resource Policy. The overall objective of this workshop was to consider the planning, implementation and administration of fisheries management under FCMA. Attending from the La Jolla Laboratory were Mr. David Mackett, Program Planning Officer and Dr. Dan Huppert, Economist. Others in attendance included:

John McAlister, Director, Ctr. for Technology Assessment and Resource Policy, Stanford University
Mela Haklisch, CTS & Resource Policy, Stanford University
William Balson, CTA, Stanford University
Steve Barrager, CTA, Stanford University
William Hogan, CTA, Stanford University
James Matheson, CTA, Stanford University

Thomas Cotton, Engineering-Economic Systems (EES), Stanford University

W.K. Linvill, Chairman, EES, Stanford University
Edison Tse, EES, Stanford University

Don Humphries, NOAA Fellow, Stanford University
Robert Junghans, NOAA Fellow, Stanford University
George Younger, NOAA Fellow, Stanford University

William Davoren, U.S. Fish and Wildlife Service, SF (formerly Dpty. to Dir., CA Coastal Commission)

Dr. Brian Rothschild, Director, Office of Policy Development and Long Range Planning, NMFS, Wash., D.C. (and former Director of the SWFC)
John Gates, OPD & LRP, NMFS, Washington, D.C.
Morton Miller, OPD, NMFS, Washington, D.C.

Paul Hooker, Director, Technical & Information Management Services, NMFS, SEFC, Miami, Florida
Wesley Parks, NMFS, SEFC, Miami, Florida

Tom Morrissey, NMFS, NE Region

Russell Nakano, Stanford University
Paul McEntire, Stanford University
Rafael G. Rivera, Stanford University

Joe Rychetnik, Tyee Club, San Francisco

January 21-24 - Mr. Paul Sund participated in a regular monthly aerial survey of marine mammals in the Los Angeles Bight as part of a BLM study by U.C. Santa Cruz. During the survey a special route was flown to investigate the distribution of gray whales with distance off the coastline near the observer station at Point Loma, California.

21-25 - FAO Working Party on Marine Mammals met at the Southwest Fisheries Center to complete writing of a report. Among these present were Drs. Luit Boerema, FAO, Rome, Italy, Ray Gambell, International Whaling Commission, Cambridge, England, K. Radway Allen, CSIRO, Australia, Masaharu Nishiwaki, Ocean Research Institute, Tokyo, Japan, Richard Laws, Polar Survey, Cambridge, England, Kai Curry-Lindahl, UNITRRA, Nairobi, Kenya, Nigel Bonner, Polar Survey, England, Peter McCroy, Institute of Marine Science, Fairbanks, Alaska. From the La Jolla Laboratory, Dr. William Perrin attended.

22 - Mr. Shomura departed for Noumea, New Caledonia, to attend the South Pacific Commission 9th Regional Technical Meeting on Fisheries (underwritten by SPC); he returned to Honolulu on January 28, and departed again on January 30 (with Acting Center Director, I. Barrett) to attend the PTDF/WPC meeting in Agana, Guam, February 1-4.

January 23-27 - Dr. G. Moser of the La Jolla Laboratory traveled to Washington, D.C. to attend the Marine Minerals Workshop held by the Marine Board of National Research Council on effects of deep ocean mining on fisheries.

25 - Dr. William Lenarz of the Tiburon Laboratory attended a meeting of the Western Fish Marketing Association in Eureka, joining biologists from the Northwest Center, the Washington State Dept. of Fisheries and California and Oregon Departments of Fish and Game, discussing with fishermen the needs of the coast-wide rockfish survey.

25-27 - Dr. M. Laurs of the La Jolla Laboratory traveled to Corvallis, Oregon to consult with staff at Oregon State University's School of Oceanography on albacore-oceanography studies and to present a seminar on his albacore research.

27 - Dr. Jeannette Whipple presented a paper at the Oregon Chapter meetings of the American Fisheries Society at Ka-nee-ta, Oregon on the topic of the potential effects of petroleum hydrocarbon pollution on spawning fishes.

29 - March 4 - Acting Center Director Barrett in Guam to attend the meeting of the Western Pacific Regional Fisheries Management Council. Mr. Barrett is a member of the Scientific and Statistical Committee of the Council.

VISITORS

Honolulu Laboratory

January 5 and 12 - Messrs. Colin Kurata, Frank Goto, Jr., and Brian Taniguchi, students at the University of Hawaii Law School, visited Mr. Tamio Otsu to discuss Hawaiian and Japanese fisheries.

La Jolla Laboratory

January 11 - Sandy Moore, Oregon State University, Corvallis, Oregon.

- Mr. Brian M. Jarvis, NOAA, NMFS, PEG, Tiburon Laboratory.

14 - Messrs. Hal Peterson, University of Rhode Island and Jack Mossi, Narragansett, Mass. to meet with Program and Planning Officer David Mackett regarding MARMAP data systems.

Pacific Environmental Group

January 13 - Jack W. Jossi, MARMAP Field Group, Narragansett, R.I.

- Harold Peterson, Pastore Laboratory, University of Rhode Island

January 14 - Robert C. Junghans, NOAA Office of Environmental Monitoring. He is currently at Stanford University on a Special Fellowship Program for NOAA Headquarters Personnel.

19 - D.J. Bepristis, Environmental Science, Naval Postgraduate School, Monterey, Ca.

25 - *Bill Woodward, NOAA Office of Ocean Engineering, Washington, D.C.

-*Dr. R.E. Bunney, NOAA Data Buoy Office, Bay St. Louis, Ms.

-*D. K. Ela, NOAA Office of Ocean Engineering, Rockville, Md.

-*Dr. J. Shuman, NOAA Office of Ocean Engineering, Rockville, Md.

*Members of a team surveying NOAA programs for the newly formed Office of Ocean Engineering.

Tiburon Laboratory

January 3 - James R. Payne and Timothy T. Schmidt, Bodega Marine Laboratory, Bodega Bay, Ca.

7 - Chris Keusink, Santa Cruz, Ca.

10 - Lou Silva, Mural Workshop, Oakland, Ca.

12 - William F. Gusey, Shell Oil Company, Houston, Tx.

14 - Martin Baker, A. Daigger & Co., Richmond, Ca.

PERSONNEL

October 24 - Mary Lynne Godfrey, Reassignment to Administrative Officer - Honolulu Laboratory.

November 21 - Melvin J. Dutro, Promotion - Honolulu Laboratory

January 3 - The following Biological Technicians - Temporary Appointments - La Jolla Laboratory:

Robert Pitman
Philip Unitt
Gary Friedricksen
Lawrence Wade
Benson Lee
Dale Powers
James Lambert
William Walker

January 7 - Paul J. Struhsaker, Reasignment - Honolulu Laboratory.

11 - Charles J. Boyle, Biological Aid (Fisheries), Temporary Appointment - Honolulu Laboratory.

- Robert Ando, Physical Science Aid, Temporary Appointment - La Jolla Laboratory.

14 - Brian J. Lau, Biological Aid (Fisheries), Temporary Appointment - Honolulu Laboratory.

- Donald B. Majors, Biological Aid (Fisheries), Termination - Honolulu Laboratory.

16 - Maryl Cohen, Biological Aid, Appointment (Term) - Tiburon Laboratory

- David Smart, Biological Technician, Appointment (Term) - Tiburon Laboratory.

- Nancy Wiley, Computer Specialist, Transfer from La Jolla - Tiburon Laboratory

17 - Carol Walker, Keypunch Operator, Expiration of Appointment - La Jolla Laboratory

25 - Teri Hanratty, Physical Science Technician, Termination - PEG

30 - John Scholl, Biological Technician, Appointment (Term) - Tiburon Laboratory.

- Marleen DiBona, Administrative Clerk, Promotion - La Jolla Laboratory.

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